

A

06/01/98
1586 U S PTOPlease type a plus sign (+) inside this box → ☐PTO/SB/05 (4/98)
Approved for use through 09/30/2000 OMB 0651-0032
Patent and Trademark Office U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

**UTILITY
PATENT APPLICATION
TRANSMITTAL**

(Only for new nonprovisional applications under 37 C.F.R. § 1.53(b))

Attorney Docket No.	
First Inventor or Application Identifier	Scott, A. Sutcliffe
Title	Collapsible Baby Stroller And...
Express Mail Label No.	261866601

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents

- 1 ☒ * Fee Transmittal Form (e.g. PTO/SB/17)
(Submit an original and a duplicate for fee processing)
- 2 ☒ Specification [Total Pages **15**]
(preferred arrangement set forth below)
Descriptive title of the invention
- Cross References to Related Applications
Statement Regarding Fed sponsored R & D
- Reference to Microfiche Appendix
Background of the invention
Brief Summary of the invention
Brief Description of the Drawings (if filed)
Detailed Description
Claim(s)
Abstract of the Disclosure
- 3 ☒ Drawings (35 U.S.C. 113) [Total Sheets **6**]
- 4 Oath or Declaration [Total Pages **2**]
a ☒ Newly executed (original or copy)
b ☐ Copy from a prior application (37 C.F.R. § 1.63(d))
(for continuation/divisional with Box 16 completed)
☐ **DELETION OF INVENTOR(S)**
Signed statement attached deleting inventor(s) named in the prior application, see 37 C.F.R. §§ 1.63(d)(2) and 1.33(b)

***NOTE: FEES ITEMS 1 & 23 IN ORDER TO BE ENTITLED TO PAY SMALL ENTITY FEES, A SMALL ENTITY STATEMENT IS REQUIRED (37 C.F.R. § 1.27), EXCEPT IF ONE FILED IN A PRIOR APPLICATION IS RELIED UPON (37 C.F.R. § 1.28).**

ADDRESS TOAssistant Commissioner for Patents
Box Patent Application
Washington, DC 20231

- 5 ☐ Microfilm Computer Program (Appendix)
- 6 Nucleotide and/or Amino Acid Sequence Submission (if applicable, all necessary)
a ☐ Computer Readable Copy
b ☐ Paper Copy (identical to computer copy)
c ☐ Statement verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

- 7 ☐ Assignment Papers (cover sheet & document(s))
- 8 ☐ 37 C.F.R. § 3.73(b) Statement of Power of Attorney (when there is an assignee)
- 9 ☐ English Translation Document (if applicable)
- 10 ☐ Information Disclosure Statement (IDS)/PTO-1449 ☐ Copies of IDS Citations
- 11 ☐ Preliminary Amendment
- 12 ☒ Return Receipt Postcard (MPEP 503) (Should be specifically itemized)
- 13 ☒ * Small Entity Statement filed in prior application, Status still proper and desired (PTO/SB/09-12)
- 14 ☐ Certified Copy of Priority Document(s) (if foreign priority is claimed)
- 15 ☐ Other

16. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in a preliminary amendment

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No. _____

Prior application information Examiner _____ Group / Art Unit _____

For CONTINUATION or DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 4b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

17. CORRESPONDENCE ADDRESS

☐ Customer Number or Bar Code Label (Insert Customer No. or Attach bar code label here) or ☒ Correspondence address below

Name	Andreas von Flotow				
	Hood Technology Corporation				
Address	1750 Country Club Road				
City	Hood River	State	OR	Zip Code	97031
Country	USA	Telephone	541-387-2288	Fax	541-387-2266

Name (Print Type)	Andreas von Flotow	Registration No. (Attorney/Agent)	
Signature	A. von Flotow	Date	28 May 98

Bureau Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Box Patent Application, Washington, DC 20231.

PTO/SB17 (2/95)
Approved for use through 9/30/2000 OMB 0651-0032
Patent and Trademark Office U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number

FEE TRANSMITTAL

*Patent fees are subject to annual revision on October 1.
These are the fees effective October 1, 1997.
Small Entity payments must be supported by a small entity statement,
otherwise large entity fees must be paid. See Forms PTO/SB09-12
See 37 C.F.R. §§ 1.27 and 1.28*

TOTAL AMOUNT OF PAYMENT (\$) **395.00**

Complete if Known

Application Number	
Filing Date	
First Named Inventor	Scott A. Sutherland
Examiner Name	
Group / Art Unit	
Attorney Docket No.	

METHOD OF PAYMENT (check one)

1. ☐ The Commissioner is hereby authorized to charge indicated fees and credit any over payments to:

Deposit Account Number: _____
Deposit Account Name: _____

☐ Charge Any Additional Fee Required Under 37 C.F.R. §§ 1.16 and 1.17 ☐ Charge the Issue Fee Set in 37 C.F.R. § 1.18 at the Making of the Notice of Allowance

2. ☒ **Payment Enclosed:**
☒ Check ☐ Money Order ☐ Other

FEE CALCULATION

1. BASIC FILING FEE

Large Entity		Small Entity		Fee Description	Fee Paid
Code	Fee (\$)	Code	Fee (\$)		
101	790	201	395	Utility filing fee	395
106	330	206	165	Design filing fee	
107	540	207	270	Plant filing fee	
103	790	203	395	Reissue filing fee	
114	150	214	75	Provisional filing fee	
SUBTOTAL (1)					(\$ 395.00)

2. EXTRA CLAIM FEES

Total Claims		Extra Claims		Fee from below		Fee Paid	
Independent Claims	18	-20**	=				
Multiple Dependent Claims	2	3**	=				

**or number previously paid, if greater. For Reissues, see below

Large Entity		Small Entity		Fee Description	Fee Paid
Code	Fee (\$)	Code	Fee (\$)		
103	22	203	11	Claims in excess of 20	
102	82	202	41	Independent claims in excess of 3	
104	270	204	135	Multiple dependent claim, if not paid	
109	62	209	41	** Reissue independent claims over original patent	
110	22	210	11	** Reissue claims in excess of 20 and over original patent	
SUBTOTAL (2)					(\$)

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity		Small Entity		Fee Description	Fee Paid
Code	Fee (\$)	Code	Fee (\$)		
105	130	205	65	Surcharge - late filing fee or oath	
127	50	227	25	Surcharge - late provisional filing fee or cover sheet	
139	130	139	130	Non-English specification	
147	2,520	147	2,520	For filing a request for reexamination	
112	920*	112	920*	Requesting publication of SIR prior to Examiner action	
113	1,840*	113	1,840*	Requesting publication of SIR after Examiner action	
115	110	215	55	Extension for reply within first month	
116	400	216	200	Extension for reply within second month	
117	560	217	475	Extension for reply within third month	
118	1,510	218	755	Extension for reply within fourth month	
128	2,060	228	1,030	Extension for reply within fifth month	
119	310	219	155	Notice of Appeal	
120	310	220	155	Filing a brief in support of an appeal	
121	270	221	135	Request for oral hearing	
138	1,510	138	1,510	Petition to institute a public use proceeding	
140	110	240	55	Petition to revive - unavoidable	
141	1,320	241	660	Petition to revive - unintentional	
142	1,320	242	660	Utility issue fee (or reissue)	
143	450	243	225	Design issue fee	
144	670	244	335	Plant issue fee	
122	130	122	130	Petitions to the Commissioner	
123	50	123	50	Petitions related to provisional applications	
126	240	126	240	Submission of Information Disclosure Sheet	
531	40	531	40	Recording each patent assignment per property (times number of properties)	
145	790	245	395	Filing a submission after final rejection (37 C.F.R. 1.29(a))	
149	790	249	395	For each additional invention to be examined (37 C.F.R. 1.29(b))	
Other fee (specify): _____					
Other fee (specify): _____					
SUBTOTAL (3)					(\$)

* Reduced by Basic Filing Fee Paid

SUBMITTED BY

Typed or Printed Name	Andreas von Flotow
Signature	A. von Flotow

Complete (if applicable)

Reg Number	
Date	28 May 98
Deposit Account User ID	

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231

Patent Application of
Scott A. Sutherland and Andreas H. von Flotow
for
**COLLAPSIBLE BABY STROLLER
AND RELEASABLE LOCKING AND FOLDING MECHANISM THEREFOR**

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to wheeled infant carriages or designed to carry an infant smoothly and safely while walking, jogging or traversing uneven, rough, or unpaved terrain. And more particularly to a design conveniently portable and collapsible.

2. Description of The Prior Art

Traditionally, baby strollers have been used to push an infant slowly on a relatively hard, smooth floor or paved surface. As a result, the strollers were made with short wheeled bases and small wheels. These strollers work well at slow speed, but are extremely unwieldy and even dangerous on rough surfaces or at higher speeds.

As parents have become more health conscious, jogging and fast walking have become popular pastimes. Because baby strollers were not designed to be operated at high speed or on rough terrain, it was infeasible for a parent to jog or walk fast using a traditional baby stroller. Even for non-jogging parents, the need for an improved baby stroller has been apparent. The small,

plastic wheels and short wheel bases customarily used for the baby strollers are almost useless when it is desired to walk with an infant in a grassy park or on a rough road or sidewalk. Parents end up not walking with the infant at all or only walking in limited areas.

Recently, all-terrain baby strollers have been designed to overcome these problems. These strollers typically employ much larger wheels and longer wheel bases. The stroller frame and frame connections are constructed to be stronger and larger to handle the heavy-duty use they may receive. These all-terrain strollers have their drawbacks. The increased size has made them difficult to store and transport and the folding/collapsing mechanisms are time consuming and cumbersome. For this reason, the present invention provides a quick and easy method of collapsing the stroller for storage or transport.

3. Objects and Advantages

Collapsible strollers are not a new concept. The collapsing process for most strollers, however, typically requires the use of both hands, often requires the application of large forces, and may be dangerous due to scissoring of truss-like members of the stroller structure. Most collapsing mechanisms are not intuitive to the user and require a lesson from a sales person or studying of instructions. Often, the parent is holding packages or the infant in one arm and has only one hand free to collapse and stow the stroller. The present invention provides an intuitive folding mechanism, requiring only one hand to collapse or unfold the stroller. Safeguards assure that the stroller collapses only when desired by the parent. Further, there are no pinch points or scissoring members in the folding mechanism.

When jogging with a conventional all-terrain stroller, the axle connecting the two rear tires often impedes the stride of the jogger (especially joggers with long strides). In the present invention, the rear wheels are cantilevered, giving the jogger clearance for a long stride.

Other novel features of the design are the use of an over-center mechanism to deploy a sun canopy on the stroller and another over-center mechanism to engage a foot-activated parking brake.

SUMMARY OF THE INVENTION

The present invention is an all terrain/jogging, portable, collapsible baby stroller. The stroller frame consists of three cantilevered, tubular sections, which are hinged and constrained to move together by a means for such purpose. The three cantilevered sections are the front fork, which holds the front tire, the handle bar, and the rear support, on which the rear tires are mounted.

The means for hinging and constraining the motion of the cantilevered sections consists of a mechanism on either side of the stroller. Each mechanism consists of two meshing partial gears and a spring-loaded piston, which moves in line with the rear support. Secured to the side of each gear is a knife blade follower, which comes in contact with the piston in the locked and unfolded position. One gear is fixed to the front fork while the other is fixed to the handle bar. In the locked and unfolded position, the rotation of the gears with respect to one another is constrained by a flat in one direction and the knife blade followers against the extended spring loaded piston in the other direction. The cantilevered sections are constrained at fixed angles to one another. In this embodiment, the front fork forms approximately a 90-degree angle with the rear support and approximately a 180-degree angle with the handle bar. The rear support bisects the angle between the handle bar and the front fork.

To collapse the stroller, the stroller is lifted by a strap which is connected on either end to a lever, which depresses the spring-loaded piston on each side of the stroller. With the depression of the spring-loaded piston, the rotation of the gears relative to one another is no longer constrained. Continuing to hold the strap causes the stroller to collapse under its own weight; all of the cantilevered sections rotate into positions approximately parallel to one another.

The front fork consists of two separate pieces of tubing. At one end, each piece is fixed to the folding mechanism. At the opposite end a notch is cut in each tubular piece to accommodate the axle of the front tire. The notch allows the user to quickly remove the front tire.

The handle bar is made from a single piece of tubing or bar stock bent through 180 degrees so that the ends of the piece are parallel to one another. Each end is fixed to one of the two folding

mechanisms. The bent portion of the tubing is typically from where the stroller will be pushed. Therefore, it is coated with foam for comfort.

The present embodiment of the invention contains a retractable canopy to shelter the infant from the elements. The canopy is made from a piece of fabric. The front edge of the fabric is secured to a batten or bent rod, which gives the canopy its shape. The rear edge is secured to the handle bar. The forward batten is connected to the handle bar through two over-center mechanisms. These over-center mechanisms allow the canopy to be fully deployed or fully retracted, in a firm and stable manner.

Each over center mechanism consists of a casing, a spring-loaded rod and a rotating piece. The spring-loaded rod is constrained as a slider joint by the casing and as a pin joint by the rotating piece. The casing is fixed to the handle bar and the rotating piece is fixed to the batten. The rotational freedom of the rotating piece is constrained by a groove in the casing. Because of the motion constraints on the rotating piece, the canopy will become fully deployed if the canopy is moved more than half way to the deployed position or fully retracted if the rotating piece is moved less than half way to the deployed position.

The rear wheels are mounted to the rear support via a hub assembly for such purpose. Each rear wheel axle fits into a hole in a hub assembly case, which is injection molded plastic. The axle is notched and held in place by a spring-loaded pin, which fits in the notch. The spring-loaded pin acts as a quick-release mechanism. When the pin is pulled, the axle can easily be removed from the hub assembly. To replace the wheel, the axle is inserted into the hub assembly and snaps into place, as the spring-loaded pin seats in the groove in the axle.

The hub assembly also houses a foot brake. The foot brake employs an over-center mechanism similar to the one used for the canopy deployment. The foot brake lever, typically made from stamped steel, is pinned to the hub assembly casing. When the lever is rotated, a finger, which is part of the lever, engages with a toothed disk, which is fixed to the wheel. The rotating motion of the lever is affected by an over-center mechanism. The over-center mechanism consists of a spring-loaded rod, pinned to the lever on one end and fixed as a slider by the hub assembly casing on the other end. When the lever is between the fully-engaged and the fully-

disengaged positions, the over-center mechanism tends to move the lever to either position. Another important feature to the design of this foot brake is the use of plastic or metal balls on the rod, between which the spring seats. The balls prevent the spring from binding on the hub assembly casing or the lever and allow low friction movement.

BRIEF DESCRIPTION OF THE DRAWINGS

The above features, advantages, and object of the present invention will more fully be appreciated through consideration of the following drawings in which:

FIG 1 shows an isometric view of the present invention, a collapsible all-terrain stroller.

FIG 2 shows an exploded view of the folding mechanism, which allows the user to easily fold and unfold the stroller.

FIG 3 shows orthogonal views depicting the functionality of the folding mechanism.

FIG 4 shows an exploded view of the canopy deployment mechanism.

FIG 5 depicts the functionality of the canopy deployment mechanism.

FIG 6 shows an orthogonal view of the hub assembly.

FIG 7 shows isometric and orthogonal views of the folding procedure.

REFERENCE NUMERALS IN DRAWINGS

2	Front Fork
3	Rear Support
4	Handle Bar
10	Folding Mechanism
11	Outer Half of Folding Mechanism Case
12	Inner Half of Folding Mechanism Case
13	Forward Partial Gear
14	Rear Partial Gear
15	Knife Blade Follower on Forward Partial Gear
16	Knife Blade Follower on Rear Partial Gear
17	Spring Loaded Piston
18	Release Lever
19	Fulcrum Plate
20	Fulcrum Pin
21	Gear Hubs
22	Spring for Piston
30	Front Wheel
32	Foot Rest
34	Release Strap
36	Infant Seat
40	Hub Assembly

- 41 Hub Assembly Case
- 42 Quick Release Pin
- 43 Quick Release Spring
- 44 Brake Lever
- 45 Brake Lever Fulcrum
- 46 Over-center Mechanism Rod
- 47 Over-center Mechanism Spring
- 48 Nylon Balls
- 49 Toothed Disk
- 50 Assembly Bolts
- 51 Rear Axle
- 60 Mechanism for retracting Canopy
 - 61 Over-center Mechanism Rod
 - 62 Canopy Deployment Mechanism Casing
 - 63 Rotating Piece
 - 64 Forward Canopy Batten
 - 65 Over-center Mechanism Spring
 - 66 Fastener from Casing to Handle Bar
 - 67 Fastener from Casing to Handle Bar, mating with groove in rotating piece
 - 68 Fastener about which rotating piece rotates
 - 69 Canopy

DETAILED DESCRIPTION OF THE INVENTION

1. Overall Stroller Configuration

Referring now to the drawings, particularly **FIG 1**, there is shown a three-wheeled all terrain collapsible infant stroller. Three rigid assemblies **2-4**, which are connected to one another via two folding mechanisms **10**, form the fundamental structure of the stroller.

The front fork **2** consists of two pieces of tubing **2a-2b**. One end of each front fork section **2a-2b** is notched in order to accommodate the axle of the front wheel **30**, allowing for easy disassembly. The other end of each front fork half **2a-2b** is attached to a folding mechanism **10**. A footrest **32** is secured to both halves **2a-2b** of the front fork **2** above the front wheel **30**.

The rear support **3** consists of two rear legs **3a-3b** and a cross brace **3c**, which are made from tubing. For each leg **3a-3b**, one end is secured to a folding mechanism **10** and the other secured to a hub assembly **40**. The cross brace **3c** is secured to both rear legs **3a-3b**, sufficiently close to the folding mechanism **10** to provide clearance for long strides.

The handle bar **4** is made from a single piece of tubing or bar stock, bent through 180 degrees. Each end of the handle bar **4** is secured to one of the two folding

mechanisms 10. A retractable canopy 60 is attached to the handle bar 4 in order to protect the infant from the elements.

2. *Releasable Locking and Folding Mechanism*

A key feature of the present invention is a novel folding mechanism 10. An exploded view of the folding mechanism 10 is shown in FIG. 2 and a functionality view is shown in FIG. 3. The folding mechanisms 10 control the angles between the front fork 2, the rear support 3, and the handle bar 4, and thus enables the user to collapse or unfold the stroller with ease. Within the folding mechanism are two meshing partial gears 13-14, made of stamped steel in the preferred embodiment of the present invention. The gears 13-14 rotate about gear hubs 21, which are fixed to the folding mechanism case, consisting of a outer 11 and inner 12 half. Partial gear 13 has an appendage which is fastened to the handle bar 4 and partial gear 14 has an appendage which is fastened to the front fork 2. The case 11-12 is secured to the rear support 3. The meshing of the gears 13-14 constrains the relative angle between the handle bar 4 and the front fork 2, so that when the handle bar 4 is rotated toward the rear support 3, the front fork 2 rotates toward the rear support 3 and vice versa. This is a key feature in the design because it enables the stroller to be unfolded by merely lifting on the handle bar 4. Gravity rotates the handle bar 4 away from the rear support 3, and the front fork 2 swings out into position.

It is desired to keep the stroller in a locked and open position until the user wishes to fold it up for storage or transport. The folding mechanism 10 contains features to accomplish this. Each gear 13-14 has a knife blade follower 15-16, made from stamped steel in the preferred embodiment, fastened to it. Knife blade follower 15 is fixed to the inner side of partial gear 13 and knife blade follower 16 is fixed to the outer side partial gear 14 so that the followers 15-16 do not interfere with one another when the stroller is collapsed. When the stroller unfolds into a fully open position, a piston 17, is pushed down by the knife blade followers 15-16 against a loaded spring 22 until the followers 15-16 reach the fully open position and the piston 17 is forced between the followers 15-16 by the spring 22. Thus the rotation of the handle bar 4 and front fork 2 relative to the rear support 3 is constrained by a lack of gear teeth in one direction and the knife blade followers 15-16 against the spring-loaded piston 17 in the other direction.

A key feature of the folding mechanism 10 is that the piston 17 and followers 15-16 are engaging in a wedging manner due to the angled piston 17 - follower 15-16 engagement surfaces. This wedged piston 17 has sufficient travel to accommodate manufacturing tolerances and wear accumulations by continuing to wedge the followers apart until the mechanism 10 is firmly locked open. The piston spring 22 is adequately sized to always drive the piston 17 into its highest possible position, maximizing the rigidity of the entire frame structure.

It is also desired to be able to easily collapse the stroller for storage or transport. The stroller is unable to collapse until the spring-loaded piston 17 is retracted so that the gears 13-14 are free to rotate relative to the case 11-12. In order to retract the spring-loaded piston 17, a release lever 18 rocks about fulcrum pin 20, which is held in place by fulcrum plate 19. The fulcrum plate 19 is fastened to the inner half 12 of the case so that when a force is applied to the long arm of the release lever 18, a force which tends to retract the spring-loaded piston 17 is generated.

In the preferred embodiment of the invention, a release strap 34 is connected to the release lever 18 on both folding mechanisms 10. The release strap 34 lays in the seat 36 so that when the infant is removed from the stroller, the parent can lift on the release strap 34, which retracts the spring-loaded pistons 17, allowing the handle bar 4 and front fork 2 to rotate toward the rear support 3. Because the center of gravity of the handle bar 4 is typically above the folding mechanism 10, the stroller tends to collapse under its own weight when the release strap 34, is pulled, thus requiring only one free hand to collapse the stroller. Similarly, when unfolding the stroller, lifting the handle bar 4 tends to unfold the stroller. When the stroller fully open, the spring-loaded piston 17, moves between the knife blade followers 15-16, locking the stroller in its operational position.

3. Canopy Deployment Mechanism

The mechanism 60 for deploying and retracting a canopy 69 is a novel feature of the present invention. An exploded view of this mechanism is shown in FIG. 4 and a functionality view is shown in FIG. 5. This mechanism consists primarily of a spring-loaded rod 61, a mechanism casing 62, and a rotating piece 63. The casing 62, made from injection molded plastic in the preferred embodiment, is fixed to the handle bar 4 with fasteners 66-67. The rotating piece 63,

made from injection molded plastic in the preferred embodiment, rotates about fastener 68, which mates with the casing 62. Spring 65 fits around rod 61. The spring-loaded rod 61 has a slider joint with the casing 62 and a pin joint with the rotating piece 63. Batten 64 is constrained to move with the rotating piece 63 via an interference fit between the two pieces. As the rotating piece 63 rotates, the spring 65 becomes compressed. The compressed spring 65 tends to force the canopy 69 to its open position or to its deployed position depending on whether it has moved more than half way through its range of motion. The motion of the rotating piece 63 is further constrained in its rotation by fastener 67 being seated in groove 63a of the rotating piece 63.

4. Hub Assembly

The hub assembly 40, shown in FIG. 6 serves the following functions:

- 1) Provide a hub for the rear wheel axles.
- 2) Provide a quick release for the rear wheels.
- 3) Provide a rear wheel parking brake, deployable with an easy foot motion.

There are two hub assemblies 40 in the preferred embodiment; one fastened to the end of each of the rear legs 3a-3b. Each rear wheel 31 has its own axle 51. The axle 51 fits into the injection-molded hub assembly case 41 held together with assembly bolts 50, which are housed by the case 41 as well. A notch 52 is machined in the axle 51 in order to mate with a spring-loaded quick release pin 42. The quick release pin 41 prevents the axle 51 from separating from the hub assembly 40. If the user desires to remove a rear wheel 31, the quick release pin 41 is pulled away from the axle 51 and the wheel is easily removed. The spring 43 pulls the release pin 41 back so that when the axle 51 is reinserted into the hub assembly 40, it snaps securely into place.

In order to prevent the stroller from rolling when parked, a foot activated parking brake feature is designed into the hub assembly 40. A brake lever 44, made from stamped steel in the preferred embodiment, has its fulcrum 45 fixed to the hub assembly case 41. The brake lever 44 has a bulbous end 44a, in the preferred embodiment, to facilitate easy deployment or release of

the brake with a simple foot motion. When the brake lever **44** is rotated down, an appendage **44b** on the brake lever **44** engages with a toothed disk **49**, which is fixed to the rear wheel **31**. It is undesirable to have the brake inadvertently deploy or release. For this reason, an over-center mechanism is included in the preferred embodiment. A spring-loaded rod **46** is pinned to the brake lever **44** and has a slider joint with the hub assembly case **41**. The spring-loaded rod **46** is designed so that the brake lever **44** is most stable in either the fully deployed or fully retracted positions and only a deliberate foot motion from the user will change the foot brake position. In the preferred embodiment, plastic or metal balls are placed on the rod **46** on both sides of the spring **47** in order to prevent the spring **47** from binding on the brake lever **44** or hub assembly case **41**.

5. *Folding Sequence*

The folding sequence is outlined here and depicted in FIG. 7:

- 1) Depress foot brake levers **44** on both rear wheels **31** and retract canopy **60**.
- 2) Remove infant from seat **36**.
- 3) Grab hold of the release strap **34**, which is situated in the seat **36**, and lift on the strap **34** and continue to hold it. The release strap **34** will pull on both of the release levers **18**, which retract the spring-loaded pistons **17**. The handle bar **4**, because its center of gravity is above the folding mechanism **10**, will tend to rotate toward the rear support **3**, and because it is geared to the front fork **2**, the front fork **2** will rotate toward the rear support **3** as well.
- 4) The three rigid assemblies **2-4** will be parallel with one another and the stroller is ready for transport or storage. If it is desired to reduce the size of the stroller even more, the quick release pins **42** can be pulled to remove the rear wheels **31** and the front wheel **30** can also be removed.

CLAIMS

What is claimed is:

1. A conveniently transportable infant stroller for safely and smoothly carrying an infant over various terrain at speeds faster than average walking speed; said infant stroller comprising:
a frame assembly consisting of three rigid members, hinged and constrained to move together by a releasable locking and folding means.

three wheels in tricycle relationship, supported by said frame assembly, each with its own axle.

axle support means between said frame assembly and said wheels.

seat means attached to said frame assembly, said seat means being dimensioned and positioned such that the center of gravity of the infant seated therein is generally between forward and rear wheels.

means of sheltering infant from weather.

shelter support means between said means of sheltering and said frame assembly; said shelter support means giving said sheltering means a plurality of positions.

2. A releasable locking and folding mechanism for hinging three cantilevered, rigid members, constraining them to move together in a controlled manner. Said mechanism comprising:

two meshing geared components, which rotate relative to a fixed component,

a follower secured to each said meshing geared components,

a spring-loaded piston secured to the fixed component,

a means of retracting said piston against said spring, secured to said fixed component.

3. The releasable locking and folding mechanism in claim 2, wherein

one said cantilevered, rigid assembly is secured to one of said meshing geared components,

another said cantilevered, rigid assembly is secured to the other said meshing geared components,

and the third said cantilevered, rigid assembly is secured to said fixed component,

thus creating a constant angular relationship between said cantilevered, rigid assemblies.

4. The releasable locking and folding mechanism in claim 2, wherein said followers contact said spring-loaded piston.
5. The releasable locking and folding mechanism in claim 2, when said releasable locking and folding mechanism is in its locked and open position, wherein the rotational freedom of said meshing geared components is constrained by said followers contacting said spring-loaded piston in one rotational sense and by a lack of gear teeth on said meshing geared components in the opposite rotational sense.
6. The releasable locking and folding mechanism in claim 2, when said releasable locking and folding mechanism is released from its locked position, wherein said means for retracting said piston against said spring is activated, unconstraining the rotational freedom of said followers against said spring-loaded piston.
7. The releasable locking and folding mechanism in claim 2, wherein said spring-loaded piston and said followers have an angled engagement tending to drive the piston into its highest possible position.
8. The releasable locking and folding mechanism in claim 2, when said releasable locking and folding mechanism is released from its locked position, the force of gravity acting upon said cantilevered, rigid assemblies tends to rotate said cantilevered, rigid assemblies away or toward one another, depending on the orientation of the said releasable locking and folding mechanism with respect to the force of gravity.
9. The stroller in claim 1, wherein said frame assembly consists of three rigid members which are:
 - a front fork which provides a mounting location for the front wheel in the tricycle configuration,
 - a rear support which provides mounting locations for the rear wheels in the tricycle configuration, and
 - a handle bar which provides a means for pushing said stroller.

9. The stroller in claim 9, wherein a means for supporting the infant's feet is secured to said front fork.
10. The stroller in claim 9, wherein said mounting location for the front wheel consists of a notch in which the axle of said front wheel is seated.
11. The stroller in claim 9, wherein said mounting locations for the rear wheels consist of a hub assembly which provides a deployable brake to constrain the rotation of each of said rear wheels independently and a means for quick removal of said rear wheels.
12. The stroller in claim 11, wherein said deployable brake consists of a lever, pinned to the hub assembly, which, when rotated, engages a toothed disk fixed to said rear wheel.
13. The stroller in claim 12, wherein a spring-loaded rod is attached to an arm of said lever and to said hub assembly, tending to force said brake lever to a fully deployed or fully undeployed position.
14. The stroller in claim 11, wherein the means for quick removal of said rear wheels consists of a spring-loaded pin which engages a notch in the axle of said rear wheel, so that when said pin is forced against said spring, said axle is free to move in and out of said hub assembly.
15. The stroller in claim 1, wherein said means for sheltering the infant from weather consists of a piece of fabric supported by a batten or bent rod, the batten being secured to said shelter support means.
16. The stroller in claim 15, wherein said shelter support means consists of a rotating piece pivotally attached to said handle bar; said rotating piece being pinned to a spring-loaded rod.
17. The stroller in claim 16, wherein rotational freedom of said rotating piece is constrained by a fastener seating in a groove on said rotating piece.

18. The stroller in claim 16, wherein said spring-loaded rod tends to force said rotating piece to either of the constrained rotational limits.

66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99

COLLAPSIBLE BABY STROLLER AND RELEASABLE LOCKING AND FOLDING MECHANISM THEREFOR

Abstract: A baby stroller for transporting an infant over flat, rough, or uneven terrain at speeds faster than normal walking speed is disclosed. This baby stroller can be folded to make it easier to stow and transport. The folding mechanism, a unique feature of the design, enables the user to fold and unfold the stroller with one hand. Other features of the stroller include a quick release mechanism for the rear wheels, a foot-activated parking brake, and a canopy deployment mechanism

11/11/2019 11:11:11 AM

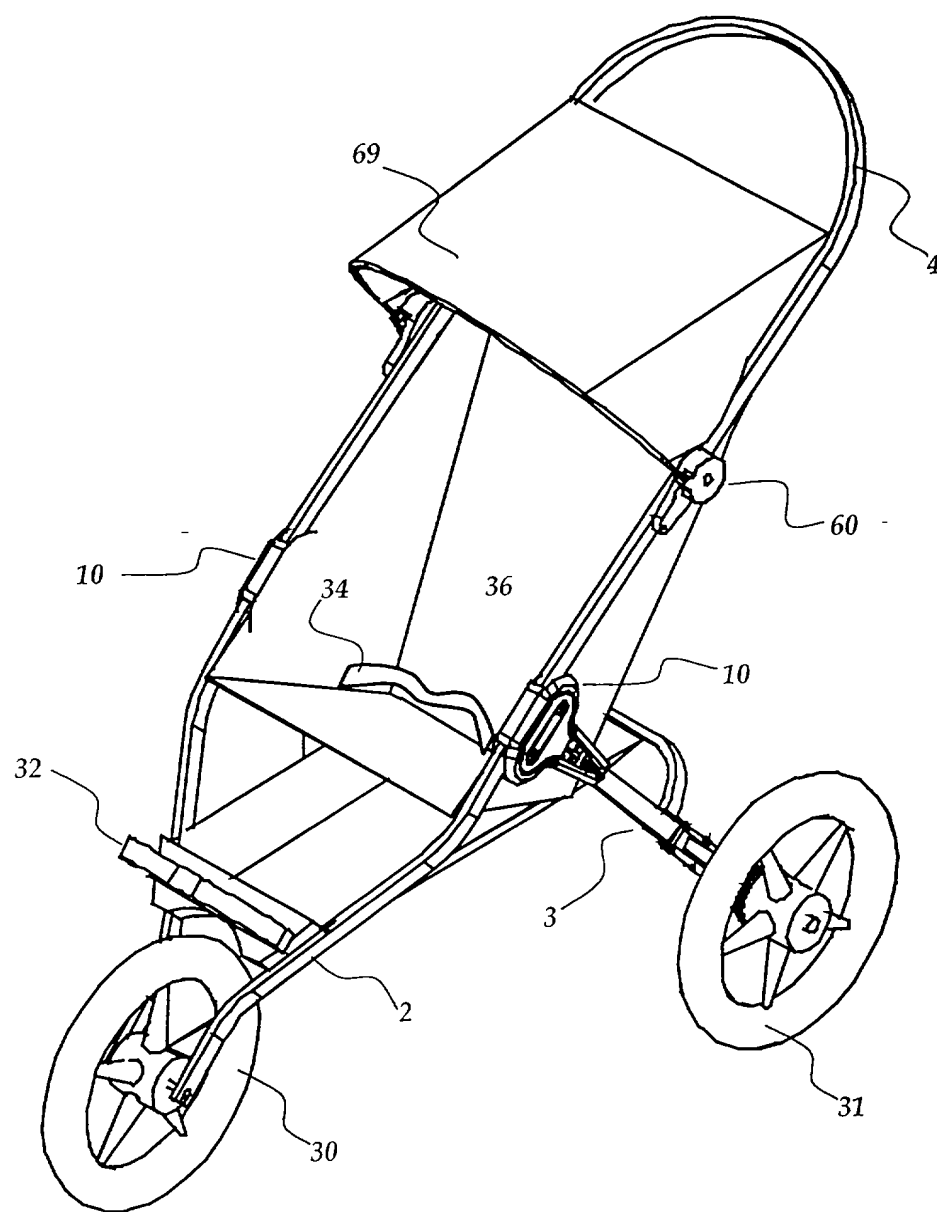


FIG. 1

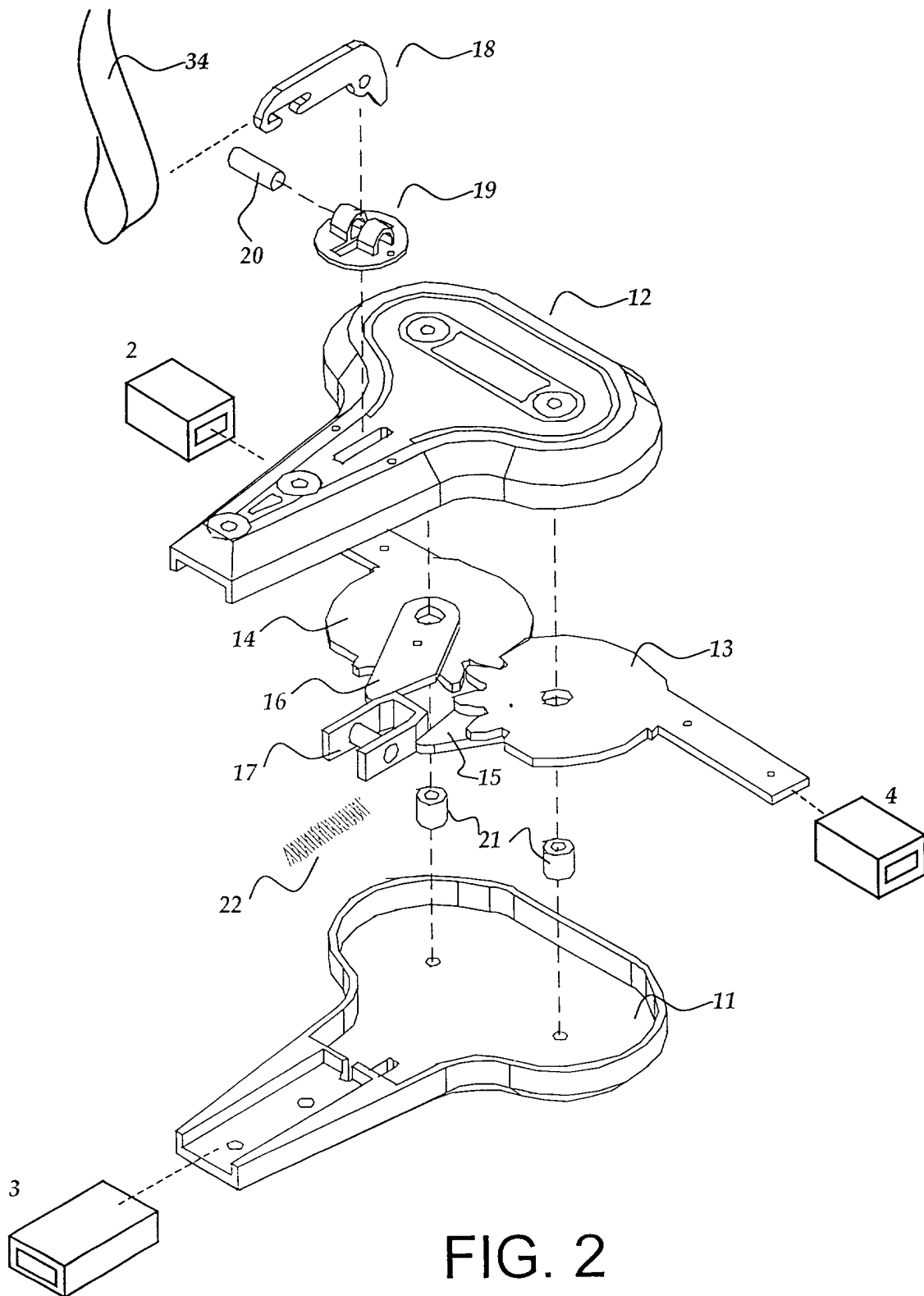


FIG. 2

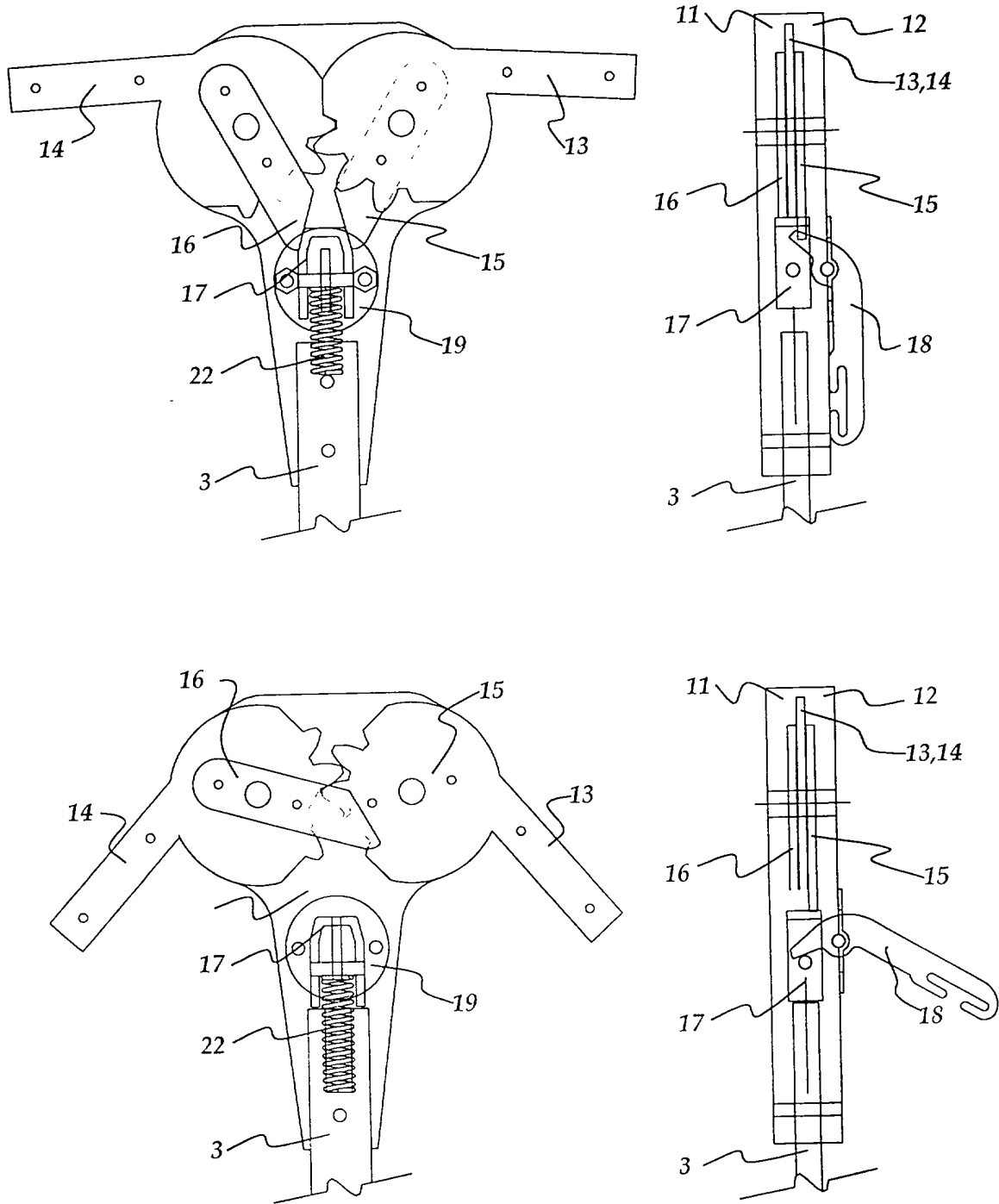


FIG 3

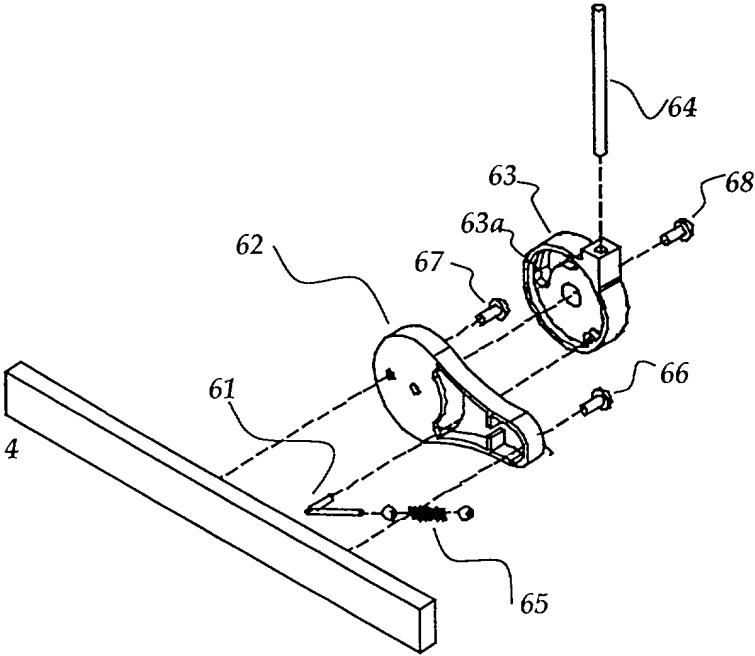


FIG. 4

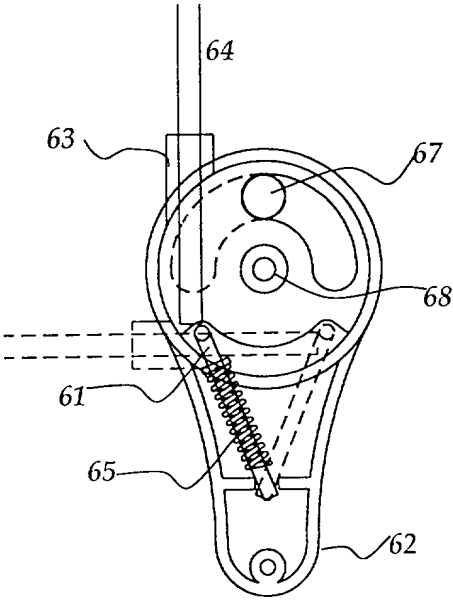


FIG. 5

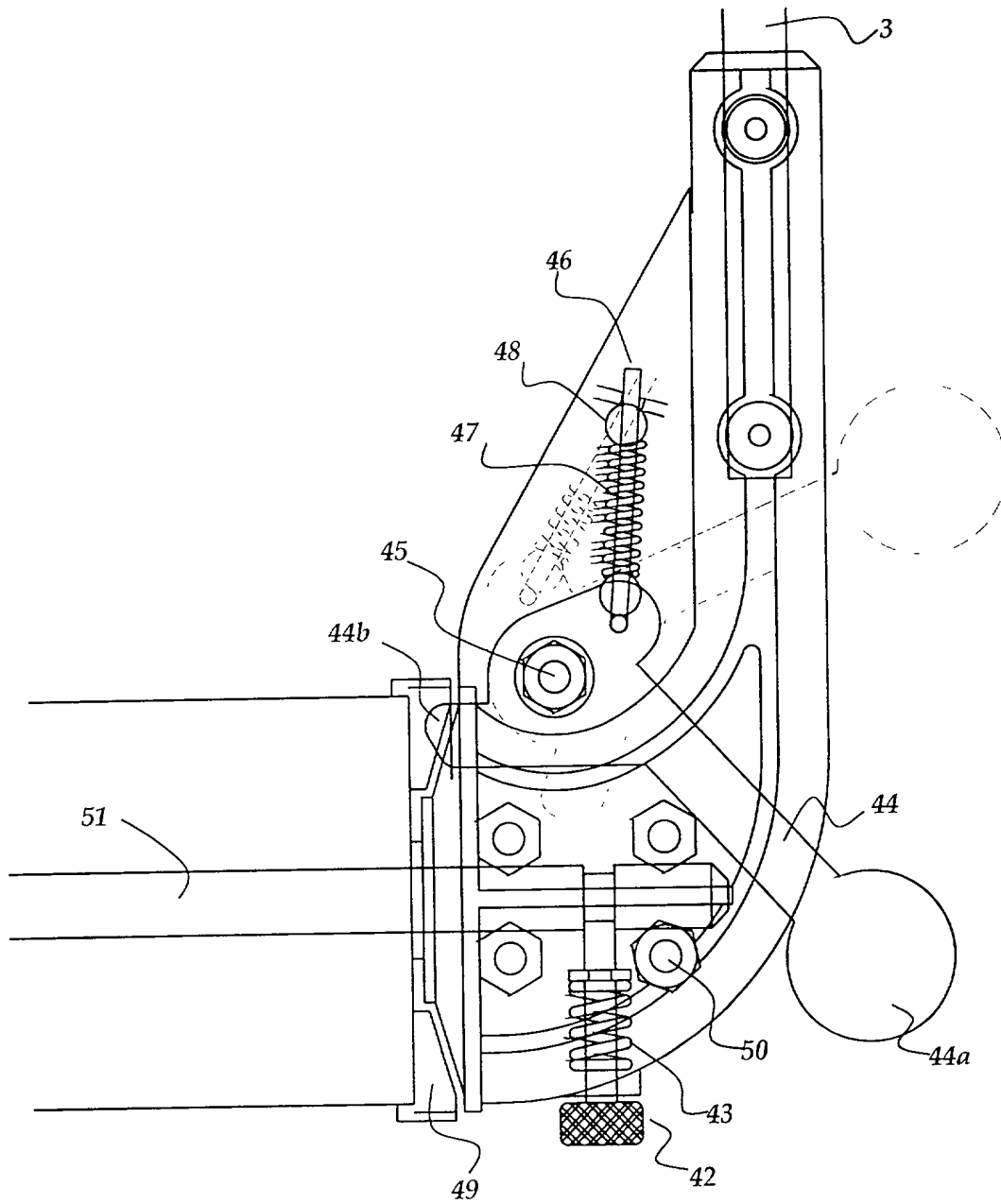


FIG. 6

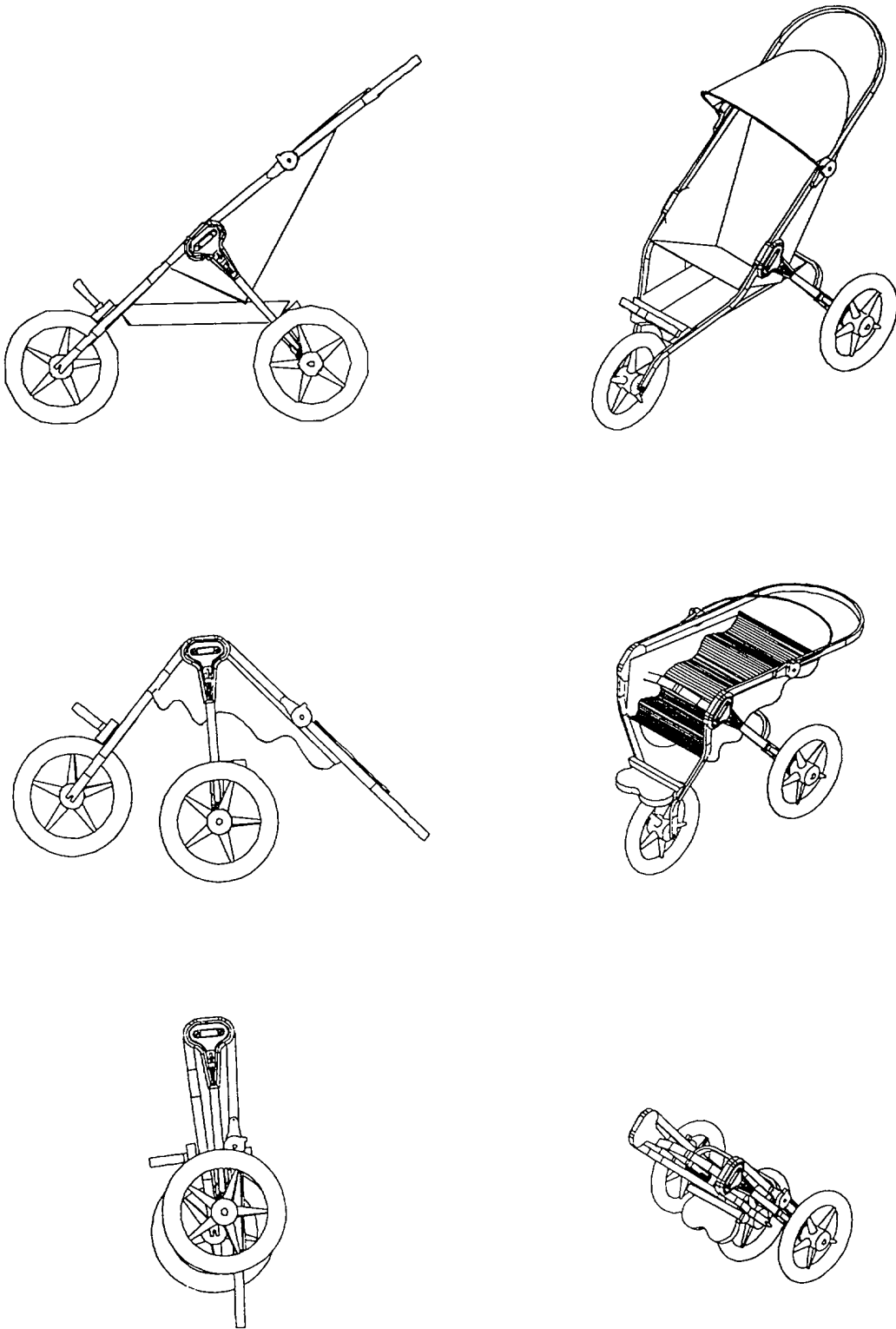


FIG. 7

**STATEMENT CLAIMING SMALL ENTITY STATUS
(37 CFR 1.9(f) & 1.27(c))--SMALL BUSINESS CONCERN**

Docket Number (Optional)

Applicant, Patentee, or Identifier Andreas von Flotow
 Application or Patent No. _____
 Filed or Issued: _____
 Title: COLLAPSIBLE BABY STROLLER AND RELEASIBLE LOCKING MECHANISM THEREFOR

I hereby state that I am

- ☒ the owner of the small business concern identified below.
☐ an official of the small business concern empowered to act on behalf of the concern identified below:

NAME OF SMALL BUSINESS CONCERN HOOD TECHNOLOGY CORPORATION

ADDRESS OF SMALL BUSINESS CONCERN 1750 COUNTRY CLUB ROAD
HOOD RIVER, OR 97031

I hereby state that the above identified small business concern qualifies as a small business concern as defined in 13 CFR Part 121 for purposes of paying reduced fees to the United States Patent and Trademark Office, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time, or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

I hereby state that rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the invention described in:

- ☒ the specification filed herewith with title as listed above.
☐ the application identified above
☐ the patent identified above

If the rights held by the above identified small business concern are not exclusive, each individual, concern, or organization having rights in the invention must file separate statements as to their status as small entities, and no rights to the invention are held by any person, other than the inventor, who would not qualify as an independent inventor under 37 CFR 1.9(c) if that person made the invention, or by any concern which would not qualify as a small business concern under 37 CFR 1.9(d), or a nonprofit organization under 37 CFR 1.9(e)

- Each person, concern, or organization having any rights in the invention is listed below:
☐ no such person, concern or organization exists
☐ each such person, concern, or organization is listed below

Separate statements are required from each named person, concern or organization having rights to the invention stating their status as small entities (37 CFR 1.27)

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate (37 CFR 1.28(b))

NAME OF PERSON SIGNING Andreas von Flotow

TITLE OF PERSON IF OTHER THAN OWNER owner

ADDRESS OF PERSON SIGNING 1750 Country Club Road, Hood River OR 97031

SIGNATURE A. von Flotow DATE 28 May 98

Please type a plus sign (+) inside this box → ☐

PTO/SB/01 (12-97)
Approved for use through 9/30/00. OMB 0651-0032
Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number

DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63) <input checked="" type="checkbox"/> Declaration Submitted with Initial Filing OR <input type="checkbox"/> Declaration Submitted after Initial Filing (surcharge (37 CFR 1.16 (e)) required)	Attorney Docket Number	
	First Named Inventor	Scott A. Sutherland
	COMPLETE IF KNOWN	
	Application Number	/
	Filing Date	
	Group Art Unit	
	Examiner Name	

As a below named inventor, I hereby declare that:

My residence, post office address, and citizenship are as stated below next to my name

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

COLLAPSIBLE BABY STROLLER AND RELEASIBLE LOCKING AND FOLDING MECHANISM THEREFOR

the specification of which (Title of the Invention)

☒ is attached hereto
OR
☐ was filed on (MM/DD/YYYY) [] as United States Application Number or PCT International Application Number [] and was amended on (MM/DD/YYYY) [] (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below by checking the box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached?	
				YES	NO
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

☐ Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

I hereby claim the benefit under 35 U.S.C. 119(e) of any United States provisional application(s) listed below

Application Number(s)	Filing Date (MM/DD/YYYY)

☐ Additional provisional application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

[Page 1 of 2]

Burden Hour Statement This form is estimated to take 0.4 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231

Please type a plus sign (+) inside this box → ☐

PTO/SB/01 (12-97)
Approved for use through 9/30/00. OMB 0651-0032
Patent and Trademark Office, U S DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number

DECLARATION — Utility or Design Patent Application

I hereby claim the benefit under 35 U.S.C. 120 of any United States application(s) or 365(c) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of 35 U.S.C. 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application

U.S. Parent Application or PCT Parent Number	Parent Filing Date (MM/DD/YYYY)	Parent Patent Number (if applicable)

☐ Additional U.S. or PCT international application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

As a named inventor I hereby appoint the following registered practitioner(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith

☐ Customer Number

OR

☐ Registered practitioner(s) name/registration number listed below

Place Customer
Number Bar Code
Label here

Name	Registration Number	Name	Registration Number

☐ Additional registered practitioner(s) named on supplemental Registered Practitioner Information sheet PTO/SB/02C attached hereto

Direct all correspondence to:

☐ Customer Number
or Bar Code Label

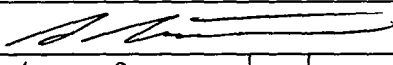
OR ☐ Correspondence address below

Name	Andreas von Flotow				
Address	Hood Technology Corporation				
Address	1750 Country Club Road				
City	Hood River	State	OR	ZIP	97031
Country	USA	Telephone	(541) 387-2298	Fax	(541) 387-2266

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon

Name of Sole or First Inventor:

☐ A petition has been filed for this unsigned inventor

Given Name (first and middle (if any))		Family Name or Surname					
Scott Andrew		Sutherland					
Inventor's Signature				Date	28 May 98		
Residence: City	Hood River	State	OR	Country	USA	Citizenship	CAN
Post Office Address	3886 Fairview Dr.						
Post Office Address	Hood River, OR 97031						
City	Hood River	State	OR	ZIP	97031	Country	USA

☐ Additional inventors are being named on the _____ supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto